

## Factors affecting the performance of UV-Curable adhesives

Factor	Reasoning	Consideration
Distance between substrate and lamp	Doubling the distance between the substrate and light source will reduce the light intensity by 75%. Optimal distance should be specified on the lamp source.	Ideally, the light source should be placed as close to the adhesive as possible; this will initiate a faster cure and reduce energy wastage.
Type of substrate	UV light may be reflected or absorbed by the substrate, meaning it cannot reach the adhesive underneath.	Ensure that at least one of the substrates allows UV light to pass through it.
Adhesive thickness	Thin film technology. If the adhesive layer is too thick, only partial cure may result. This is caused by the formation of a partially cured skin or barrier preventing the UV light from passing through to cure the adhesive underneath.	Process must be optimised for amount of adhesive dosed, substrate used, position and intensity of lamp and UV-A exposure time.
Intensity of UV-light	Flood lamps and LED lights can vary in intensity.	Invest in a high intensity lamp as an alternative to a UV-fluorescent tube if fast cure is desired.
Wavelength of light	UV-curing adhesives are designed to have a preferred wavelength at which they cure rapidly with maximum strength (typically 365 – 420nm).	Matching the wavelength to the photo-initiators in the material will provide a fast and strong cure. <b>**Please note:</b> UV cure adhesives can cure in ambient light potentially causing blockages in automated systems.

## Advantages of UV-cure adhesives

- Speed of cure
- Ability to fit into an automated process
- Strength of bond
- Cures on demand
- Single part product – no mixing involved
- Saves energy and space – UV lamps require less electricity and space compared to ovens
- Appearance – aesthetics

## Troubleshooting Info

- Dispensing system should fully prevent the adhesive from being exposed to light (opaque and UV resistant)
- Dispensing pressure should be monitored to ensure there is no clog in the system due to unwanted curing
- Materials used to construct dispensing system must be compatible – certain metals can cause the adhesive to polymerise (should only use 300 series stainless steel)
- Can also degrade plastic (only use polyethylene, polypropylene, Teflon, nylon or acetyls for plastic features)
- Applying more pressure than necessary can cause bubbling in the adhesive - For lower viscosity adhesives, pour-in or drop-in pressure pots are most effective. Ram-style pail pumps are suggested for higher viscosity adhesives.
- If the light source isn't in a fixed position, each object that is cured with it may receive different amounts of light, causing inconsistent cures. This problem is remedied by having the light built into the automation process, where the products pass by light that is at a fixed distance and intensity.

# Contact Details

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